DOCUMENT RESUME

ED 296 400 CS 506 244

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TITLE Components of Interest in Television Science Stories.

PUB DATE Jul 88

NOTE 48p.; Paper presented at the Annual Meeting of the Association for Education in Journalism and Mass Communication (71st, Portland, OR, July 2-5, 1988). Project partially funded by the Center for Environmental Communications and Education Studies in the School of Journalism and Mass Communications of the University of Wisconsin.

PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS *Audience Response; Higher Education; Interest Research; Mass Media Effects; Media Research; Memory; *Science Education; *Science Interests; *Television

IDENTIFIERS *Entertainment; Media Coverage; *Relevance (Evaluation)

ABSTRACT

While a person's "interest" is recognized as important in seeking information about science, few studies have investigated what people mean when they say they are interested in a science story or have investigated the effects of that interest on memory for science information. Two studies tested several hypotheses on two components of interest, relevance and entertainment value, and on the link between interest and memory. In the first study, subjects, 150 undergraduate students at a large midwestern university who received extra credit in journalism courses for their participation, viewed three 90-second "Science Reports for Television," and then were tested on their perceived interest in the specific report. The second study, which used 80 undergraduate students at another university (they received extra credit in a variety of speech and communication courses), was identical to the first except that it added a fourth story and several questions to the questionnaire. Results of the first study indicated that the two components of interest, relevance and entertainment value, predicted most of the variance in self-reports of interest for television science stories. The difficulty and familiarity of the story predicted small or insignificant amounts of variance in interest. Results of the second study found that interest measures predicted a significant amount of variance in memory for only some stories. (Thirteen tables of data are included, and 30 references are listed. Appendixes provide (1) transcripts of a sample report, and (2) a sample of the evaluation questions. (MS)

COMPONENTS OF INTEREST IN TELEVISION SCIENCE STORIES

Paper presented to the Theory and Methodology Division of the Association for Education in Journalism and Mass Communication, Portland, July, 1988.

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Partial financial support for this study was provided by the Center for Environmental Communications and Education Studies in the School of Journalism and Mass Communication at the University of Wisconsin-Madison.

Abstract

COMPONENTS OF INTEREST IN TELEVISION SCIENCE STORIES

While a person's "interest" is recognized as important in seeking information about science, few studies have investigated what people mean when they say they are interested in a science story or have investigated the effects of that interest on memory for science information.

Two studies indicate that two components of interest--relevance and entertainment value--predicted most of the variance in self-reports of interest for television science stories. The difficulty and familiarity of the story predicted small or insignificant amounts of variance in interest.

Despite previous findings linking interest and memory, interest measures predicted a significant amount of variance in memory for only some stories.

Both results were true even when controlling for the visual excitement of the story.

Introduction

The Meaning of Interest

According to Miller (1986) "The single most important factor affecting someone's receptivity to scientific information appears to be interest." (emphasis added) However, most research on interest in science stories has focused on information seeking and uses and gratifications concerns (for reviews see Grunig, 1980; Miller, 1986). Little research has looked at the characteristics of a science story--independent of topic--that cause the reader to perceive the story as interesting. And studies have not investigated the cognitive effects of interest in a science story.

Why do we need a more refined idea of what it means to be interested in a science story? Although a minority of those consuming mass media science information have a specific topic interest in science, most people read or view science information most often when they happen upon it in while reading newspapers and magazines, listening to radio or watching television. What a reader or viewer selects, attends to and perhaps retains may depend on his or her interest in the story. From a practical point of view, knowing the components of interest tells both practitioners and researchers what specific changes are likely to influence interest. Theoretically and methodologically, it is difficult to investigate the relationship between motivation and information processing using a vague notion like interest. Knowing the components of interest allows more precise measurement.

Britton and Tesser (1982), while maintaining that "...the topic of interest will be a major focus of cognitive psychology in the near future..." add that "the psychological meaning of the construct of "interest" has not yet been clarified to the point where it could support an interpretation." The goal of the current study is to begin logically and empirically explicating the construct of interest.

In a study of the origins of reader interest in science policy issues, Miller and Barrington (1981) define interest as the "choice by an individual of an area or issue as one worthy of the time and effort necessary to become and remain informed about it." Asher and colleagues (Asher, 1979; Asher, Hymel & Wigfield, 1978, Asher & Markell, 1974) gave the children in their experiments a simplified but very similar operational definition.

This sort of definition focuses on only one aspect of interest, the relevance or salience of the topic. While many science stories--particularly health and medical stories--are relevant to our daily lives, many are not. Stories about cosmology fascinate many people, but few people consider theories about the origins of the universe important to their daily lives. Interest in science stories may also be related to their entertainment and stimulation value.

In fact, mass media consumption may be motivated in part by stimulation seeking (Donohew, Nair & Finn, 1984). In short, there is a balance between boredom and anxiety. Stimuli that are too familiar are boring. Stimuli too novel may produce anxiety. But moderately novel stimuli may be optimally arousing (Hebb, 1955)--and thus the most interest producing. For almost all mass media fare in which the situation does not directly involve the reader the evidence indicates "excitement appears to be treasured more than drabness, even when bad news is conveyed." (Donohew, Nair & Finn, 1984 pg 281). In addition, Finn (1983,1984) found that readers most enjoyed articles about science with syntactic predictability and semantic unpredictability. Readers enjoy unfamiliar ideas presented in familiar linguistic forms. Few science stories are likely to be too arousing for most readers or viewers; so, the more exciting, unusual or entertaining the story the more likely it is to be perceived as interesting.

Finn's work contrasts with the "readability" tradition that dominated earlier research on communicating science to a mass audience. The goal of readability was to make the text as familiar and predictable as possible--short simple sentences, familiar non-technical words. Writers and researchers assumed that science readers were put-off by the supposed difficulty of science and scientific material.

Of course, a garbled account or a story so technical it is unintelligible may discourage the average reader or viewer. But within the range of normal journalistic writing very little evidence emerged that readability or other elements of the style of a science story influenced the selection or understanding of science stories (for a review, see Grunig, 1980). Nonetheless, it is still standard practice for many agencies to use readability scores as a primary evaluative measure for communications. And most journalism courses almost certainly spend more time discussing how to make a science story readable than how to make it interesting. (Of course, one reason for this is that students have so much difficulty learning to write clearly.) In practice, science journalists know they must make stories interesting as well as readable.

From this discussion, interest in mass media science has been or can be connected to four concepts. Two seem likely to be closely related to reader self-reports of interest. The first, relevance, is commonly used in science audience or policy studies such as Miller and Barrington (1981). The reader or viewer is willing to attend to the presentation because it seems important to him or her or to friends and family. The second concept, the entertainment value of the story, is connected to the ability of science stories to satisfy a reader's or viewer's need for stimulation. An entertaining story is one that is exciting or unusual.

Two other concepts seem less likely to influence a person's interest in a science story. Message difficulty is the reader or viewer's perception that a story was difficult to process or understand. Although a great deal of attention has been and is still paid to one aspect of difficulty, that is readability, there is little evidence that interest is related to difficulty. At least one study (Shapiro, 1986) found no relationship.

Finally, many science writers assume that science readers attend to a few topics with which they are familiar (Miller, 1986). Such readers would be most interested in seeking out stories on those familiar topics. While, that may be true for actively sought material, topic familiarity seems likely to have little effect on casually encountered material.

In the current study, the first four hypothesis reflect the expectation that relevance and entertainment value are better predictors of interest in a science story than are message difficulty or topic familiarity.

Hypothesis 1:

> Interest in television science stories will be related to how entertaining the story is to the viewer.

Hypothesis 2:

> Interest in television science stories will be related to how relevant the story is to the viewer.

Hypothesis 3:

> Interest in television science stories will not be related to the perceived difficulty of the story.

Hypothesis 4:

> Interest in television science stories will not be related to the perceived familiarity of the topic.

Interest and Memory

A number of field and experimental studies indicate interest in a mass media presentation is positively related to memory for that presentation. For example, a path analysis based on a survey of the origins of reader interest in science policy stories found that the second strongest path to knowledge about science was an interest construct (exposure to post-high school science classes was the strongest path) (Miller & Barrington, 1981). The effect of interest on knowledge has also been noted in studies of political communication (McLeod, Bybee & Durall, 1979) and appears to modify knowledge gap effects (Ettema, Brown & Luepker, 1983; Genova & Greenberg, 1979). Knowledge gaps occurred between people differentially interested or motivated to learn the information, not necessarily between people more or less educated. Knowledge gap effects are modified by relevance to self (Ettema, Brown & Luepker, 1983) or social interest--anticipating discussing an event with other people (Genova & Greenberg, 1979).

Several health information campaign studies found salience of health risk, arguably an indicator of interest, a significant predictor of changes in knowledge about those health risks. For example, age and perceived threat of heart attack predicted knowledge gained from an information campaign about cardiovascular risk factors (Ettema, Brown & Luepker 1983). Stanford Heart Disease Prevention Project researchers found that spouses of high-risk persons as well as the high-risk person tended to gain information from an information campaign (Farquhar, Wood et al., 1977). Pavlik and Wackman (1985) maintained that involvement may facilitate acquisition and comprehension of health information, although they found mixed support for the effect of involvement on cognitive complexity.

Experimental studies have used both children and adults as subjects. For children, interest increased scores on a cloze procedure (Asher, 1979; Asher, Hymel & Wigfield, 1978; Asher & Markell, 1974). Shapiro (1986) found that an undergraduate's self-reported interest in a specific science story explained about 31 percent of the variance in a memory test score, and was independent of reported general interest in science. Thorson & Reeves (1986) found that adult memory (recall and recognition) for television commercials was somewhat related to their "liking" of a set of commercials, but was even more strongly predicted by interest in the material that preceded and followed the commercials.

Asher, Hymel & Wigfield (1978) suggested two mechanisms for the positive relationship between interest and comprehension in children: 1. Interested children were more motivated and paid more attention. 2. interested children simply knew more about the topics in which they are interested. Thorson & Reeves (1986) conclude that liking enhances attention. Shapiro (1986) found self-reports of attention and interest highly correlated and that the relationship between interest and memory was significant even after controlling for knowledge about science in general.

However, other elements of a presentation may be confounded with interest. For example, Hidi, Baird & Hildyard, 1982 found that in most cases interesting and important material coincides in a text. Children recall less essential material when important information and interesting information is separated. Another study of fourth graders (Anderson, 1982) found that interest was a significant predictor of recall independent of a measure of attention.

In any case, the link between interest and memory seems well enough established to predict that components of interest should also predict memory for a mass media presentation.

Hypothesis 5a:

> Memory for a television science story will be related to how relevant the story is to the viewer.

Hypothesis 5b:

> Memory for a television science story will be related to how entertaining the story is to the viewer.

Hypothesis 6a:

> Memory for a television science story will not be related to the difficulty of the story to the viewer.

Hypothesis 6b:

> Memory for a television science story will not be related to the familiarity of the story to the viewer.

Some may be uncomfortable with this last hypothesis because it seems to indicate that existing knowledge structures do not enhance memory. However, there is, in fact, little evidence to support a strong version of schema theory (Alba & Hasher, 1983). This hypothesis is in keeping with the idea that the average person viewing a science story is looking for something new, not the familiar.

Experiment 1

Procedure

Subjects were 172 undergraduate students at a large midwestern university who received extra credit in Journalism courses for their participation. They took part in the experimental sessions in groups of 10 to 25 over a period of two weeks.

Subjects were asked to perform a number of tasks both before and after the tasks reported here. (See Dunwoody, Friestad & Shapiro, 1987; Shapiro, Dunwoody & Friestad, 1987 for details). These other tasks were unrelated to the current experiment. The tasks reported here were intended both as a separate study and as a distractor task in the other experiments.

Stimulus materials were three professionally prepared "Science Reports for Television" distributed by Mr. Wizard Studios and used with their permission. Each report was just under 90 seconds, and all three used the same visual and verbal format. All verbal information was presented by the narrator, Don Herbert, who appeared on camera at the beginning and end, and who voiced over complementary visuals in between. The topics were thunderstorm research, testing furniture materials for flammability and the influence of blood alcohol on human performance.

This material had several advantages. First, it is real-world stimulus material. At the same time, the presentation rate is controlled--eliminating reading speed and reading style as confounds, and the format was similar for all topics. Finally, the repeated measures design permitted a variety of topics.

Each report was edited so that three times during the report and at the end of the report, the screen went blank for about 5 seconds. The first three stops were distributed at the ends of randomly selected sentences through the reports. During these four stops, subjects were instructed to record how interested they were in the report at that point on a seven interval scale from "very interested" to "very uninterested" with neutral as the center of the scale.

To control for order, three tapes were prepared with each topic appearing in each position once over the three tapes. However, a formal Digram-balanced latin squares design would have required 6 orders and was not used. Groups were randomly assigned to view one of the taped orders. Thus, all subjects saw all three reports, but in one of three possible orders.

Because of an editing error, one of the stops was deleted from the blood alcohol story on two of the tapes. This error was corrected early in the study, and data from the 22 subjects who viewed the flawed tapes were not used in the analysis that follows. Thus, the following analysis are based on 150 subjects.

A sample story, including the locations of the stops, is shown in Appendix A.

Subjects seated themselves in the experiment room so that they could see the television monitor used for presenting the reports. After being instructed in the procedure, subjects viewed the first report, recording their interest level at each stop.

After viewing each report (including the four stops), subjects were asked to answer 10 semantic differential scale items and 10 agree-disagree items for that report. The questions are given in Appendix B. One of the items was a semantic differential type scale with "Not Interested" and "Very Interested" anchoring the ends. This was intended as an overall measure of perceived interest in the specific report. Each of the other 19 items was intended to be an indicator of one of four concepts--the relevance of the report to the viewer, the entertainment and arousal value of the report, the difficulty of understanding the report, and the familiarity of the information in the report. When all subjects finished answering the items for that report, the procedure was repeated for the next report.

Note that subjects were not asked why they were interested in a story. Considerable evidence indicates that subjects' are often wrong about what influences their mental processes (Nisbett & Wilson, 1977; Wilson & Nisbett, 1978; Nisbett & Bellows, 1977; Smith & Miller, 1978; Ericsson & Simon, 1980). Instead, each item asked the subject to rate the story on that characteristic. Subjects were not asked to relate that characteristic to interest.

After the subjects had seen all three reports, they were given 2 minutes to list all the facts they remembered from the first report. The procedure was repeated for the other two reports in the same order the subjects saw the reports.

To code these free recall protocols, the verbal material in each segment was divided into idea units. After training, two coders were given a list of the idea units from each story. For each recall protocol, the coders identified the idea units correctly recalled, and recorded the total number of idea units correctly recalled from that report. To check intercoder reliability, 26 subjects were selected using a random number table and both coders independently coded all reports for those subjects. On these protocols, the scores assigned by each coder were very similar ($r = .81$). On the items both coders scored, if the score was not identical, the mean of the two scores was recorded as the free recall score. No attempt was made to code recall of visual material. An informal examination of the protocols indicated that almost none of the material recalled could be attributed only to the visual presentation.

Results

First the results were summed across all three reports. A principal component factor analysis with orthogonal (varimax) rotation used the 19 questionnaire items intended as indicators of the components of interest. The four expected factors emerged. However, three items--two from the semantic differential scales and one from the agree-disagree questions--loaded about equally on two or more factors. These items were: "poorly written-well written", "unusual-usual" and "I didn't pay much attention to this story." When these three items were eliminated from the factor analysis, there was no change in the factor structure, and the proportion of the variance in the data space explained by the four factors actually increased slightly (from .66 to .70). All further factor analyses and the factor scores used are based on factor analyses excluding these three items.

However, note that all three excluded items are significantly related to interest (Correlation with NOTINTERESTED: Unusual r = -0.28; Poorly Written r = 0.52; No attention r = .37. All significant at alpha = .01 or better). They may represent unexplored additional components of interest.

Similar factor analyses were performed using only the results from an individual report topic. The factor structures were identical with only small differences in the loadings of individual items. Table 1a-d shows the results of these factor analyses. When examining the results, note that the amount of total variance in the data space explained by the second, third and fourth factors are very similar, and the position of these factors sometimes changes.

Insert Tables 1 a-d about here

Since, with the exception of the three excluded items, the factor structure was as expected, naming the variables was straightforward (Relevant, Entertain, Familiar and Difficult). In all subsequent analyses factor scores were used, because they are convenient orthogonal variables. However, the four factors do form four reliable scales. All Cronbach's alpha's were above .83 (See Table 2).

Insert Table 2 about here

Within each report the four stops were summed to get an "on-line" measure of interest (INTERESTSTOP). These were summed across reports for the following analyses. The correlation between this multiple-item on-line measure of interest and the single item "not interesting-interesting" semantic differential scale (NOTINTERESTED) was high ($r = -0.70$; $F = 138.0$; $p < .01$)). Since the scales run in reverse directions, the correlation is negative.

Four models using stepwise multiple regression equations were run. Two looked at which factors best predicted the measures of interest, one looked at the influence of the factors on memory, and one looked at the influence of interest variables on memory.

In general, the factors expected to predict interest did a very good job of predicting interest. Although, the factors not expected to predict interest did sometimes predict interest, the effect size was much smaller (Table 3a). For example, pooling over all three report topics, both "relevant" and "entertain" factors predicted unique amounts of the total variance in NOTINTERESTED. (As expected the partial correlations are negative with NOTINTERESTED. The more relevant and entertaining the report, the more interested the subject.) Together, these two factors predicted a large proportion of the total variance ($R^2 = 0.63$; $F(2,145) = 125.67$; $p < .01$).[1]

The results are very similar when INTERESTSTOP is the dependent variable. In this case, difficulty also adds a significant amount of unique variance to the equation (the semipartial multiple correlation, sR^2) ($sR^2 = 0.01$; $F(3,144) = 3.44$; $p < .05$). The more difficult the report, the less interested the subject in that report. However, the amount of added variance is very small (especially compared to the very large effects of relevant and entertain) and would be even smaller (and non-significant) if the other factors had not been controlled for first. (The zero order correlation for difficulty is -0.10; the partial correlation with relevant and entertain removed is -0.15).

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[1] The stepwise procedure relies, to some extent, on chance. In the stepwise multiple regressions used here, the more conservative Type I error term is used as recommended by Cohen & Cohen, (1983). Also, keep in mind that a relatively small number of variables are being used and there are strong hypothesis about which variables will and which variables will not be good predictors. Thus, in the absence of any theoretical reason for ordering entry of the variables, the stepwise procedure is conservative in that it gives those variables hypothesized to be weak predictors the best chance of being significant predictors.

The results for the individual reports are consistent with the results of the pooled reports (Tables 3 b,c,d). Entertain and relevant always explain large proportions of the variance in interest, with entertainment a better predictor for the thunderstorm report, relevance a better predictor for the blood alcohol report, and furniture testing depending on how interest is measured. Difficulty and familiarity are only occasionally significant, and even then, the effect size is always many times smaller than that for entertain and relevance. Hypotheses 1 and 2 are clearly supported. Hypotheses 3 and 4 are supported to the extent that difficulty and familiarity are not always predictors of interest, and even when they do predict interest, the effect is dramatically smaller than that of entertainment or relevance.

Insert Tables 3 a-d about here

However, neither the direct measures of interest nor the factors representing the components of interest seemed to be consistently significant predictors of the number of idea units remembered. Pooling the results over all three reports, none of the independent variables used significantly predicted the memory measure (Table 4a). Looking at the individual reports (Tables 4 b,c,d), the independent variables significantly predicted idea units only for the thunderstorm report. For that report entertain and familiar each predicted significant amounts of unique variance. In another equation, INTERESTSTOP also predicted a significant amount of unique variance (Table 4b). Hypothesis 5 is not supported. Hypothesis 6 is supported. However, such a no-results hypothesis cannot, in isolation, be considered very strong evidence.

Insert Tables 4 a-d about here

One possibility, is that many subjects could not report everything they could remember within the two-minute time limit, creating a ceiling effect that restricted the range of the idea units variables. However, the distributions looked relatively normal, and the skewness values were all slightly positive, indicating that the distribution was skewed slightly toward the low values. This is the opposite of the ceiling effect one would expect if subjects didn't have enough time to recover all their memories.

Another possibility is that although subjects had ample time to recover what they could remember, the number of idea units recalled varied in a very narrow range, making an effect difficult to find. There was some evidence this might be the case. An indication of this is the coefficient of variation (a measure of relative variation: the ratio of the standard deviation to the mean) for the number of correct idea units corresponded to the ability of the various interest measures to predict idea units. Idea units for the thunderstorm report had the largest coefficient of variation (0.47) and the best prediction. The blood alcohol report had the smallest coefficient of variation (.384) and the worst prediction.

Experiment II

In Experiment 1, despite the similarity in visual format among the reports, the specific visual content was very different. Such visual differences between the reports may influence memory independently of their ability to influence interest, obscuring the relationship between interest and memory. In addition, that visual interest may explain much of the variance in self-reports of interest.

For example, Davis & Robinson (1986) found the degree of human interest and excitement in a news story explained considerable variance in the comprehension of that news story. But those relationships were considerably reduced after controlling for the amount of visual content and the uniqueness of visual content.

In the current study, characteristics of the visual content may constitute another dimension of interest. In addition, different subjects may have been influenced by different visual images. Many subjects seemed amused by the performance of drunk subjects in the blood alcohol story, while others may have been captivated by the flaming images in the furniture testing story, or intrigued by the scientists calmly reading instruments while bouncing through a thunderstorm in the thunderstorm report. Interest in television science may have more components than interest in similar non-visual presentations.

A second experiment investigated this possibility as well as a second operationalization of memory.

Procedures

Subjects were 80 undergraduate students at another university who received extra credit in a variety of speech and communication courses. They took part in the experimental sessions in groups of 1 to 6.

Proceedures were identical to those of the first experiment except for the following: In this case a fourth story was used. Subjects saw two stories. There were six orders with all possible combinations of two stories. Several questions were added to the questionnaire aimed at producing three additional measures, a scale of visual interest, a scale of unusualness and a single measure of writing quality.

Memory was operationalized as a cloze procedure. After viewing the stories and answering a series of questions about the stories, subjects were given a transcript of the story with either every second, every third, or every fourth word removed (not counting articles). Subjects were asked to fill as many of the blanks as possible within 4 minutes.

Results

Although a sample of 80 is at best marginal for a two factor analysis, a principal component factor analysis with orthogonal (varimax) rotation on the six questions intended to make up the visual excitement and unusualness scales did separate the questions into the two factors expected. Each scale was moderately reliable (Visual alpha = .80; unusualness alpha = .66). In the following analysis, scales were constructed by summing the component questions. Factor scores were not used.

In general, the results of this experiment were almost identical to the first experiment. For example, the relevance and entertainment scales predicted about 54 percent of the variance in the combined interest measures, with none of the other variables predicting a significant amount of unique variance. Overall, the relationship between this operationalization of memory and interest was still not significant, even after controlling for visual interest and for the differences in cloze procedure.

Discussion

Components of Interest

As expected two concepts, relevance and entertainment, were strongly related to measures of subject interest in television science stories. Together these factors predicted about 64 percent of the variance in NOT INTERESTED and about 48 percent of the variance in INTEREST STOP. Two other concepts, difficulty and familiarity were weakly related if at all.

Keep in mind, however, that difficulty of the presentations probably varied in a very narrow range. The reports were professionally edited and none of the three topics was difficult or arcane. The interest results may be true only in the narrow range of difficulty used here.

Still, assuming that people tend to expose themselves and attend to science stories in which they are interested, what is a little surprising is the large role entertainment value plays in interest in television science stories and the small role played by difficulty and familiarity. This seems contrary to the assumptions made by many earlier science communication researchers.

It will be interesting to see if the same is true of newspaper and magazine science stories. If so, some modification of the traditional advice given to science journalists might be in order. Science journalists who want to interest their audience may want to pay somewhat more attention to selecting relevant topics and presenting those topics in an entertaining, active manner and perhaps pay somewhat less attention to reducing the difficulty of the material. Many working science journalists already do this.

Of course, entertainment value probably is a predictor of interest in a variety of serious topics--politics or taxes, for example. However, unlike science, few of those topics have a tradition of ignoring that entertainment value and focusing instead on the difficulty of the material.

Of course, the usual qualifications about the generalizability of laboratory experiments on undergraduates apply here. Neither the stimuli nor the subject group claims to be a random sample of the population of science stories or the population of potential consumers of mass media science stories. However, some aspects of the design do increase external validity. The use of four story topics makes it unlikely that the results are restricted to a single story or topic. Also, the basic results were replicated using two samples at different universities and using somewhat different methods. However, tests on a more broadly representative sample are needed.

Interest and Memory

Interest variables or interest components significantly predicted memory for only one of the three reports used in the first experiment. There are several possible explanations. The most obvious is that there is no relationship between interest and memory for the television science items used. However, as mentioned earlier, a number of studies have found a relationship between interest and memory, including studies of science materials (Shapiro, 1986) and of television material (Thorson & Reeves, 1986). A possible restriction of range problem was discussed earlier.

One possibility is that interest is only related to memory for very difficult material. For example, the stimulus stories used in Shapiro (1986) were purposely selected as relatively difficult and in a relatively low interest area (Physics).

Another possibility is related to Lichtenstein and Srull's (1985) distinction between on-line and memory-based processing. According to Lichtenstein and Srull, if a subject evaluates a persuasive message on-line, at some later time there is generally no relationship between memory for the arguments and a later evaluation. In this experiment, subjects were asked to evaluate the stories before being asked to remember them. Although these were not persuasive messages, there is some possibility that the evaluation reduced the relationship between interest and memory.

These speculations suggest at least two future studies, one that includes stories in a range of difficulties and one in which subjects are asked to evaluate the stories after the memory test.

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Table 1a

Pooled Data
Sorted Rotated Factor Loadings
(N = 149)

Variables	Factor 1 Relevant	Factor 2 Difficult	Factor 3 Familiar	Factor 4 Entertain
FRIENDS	0.844	0.000	0.000	0.000
GLAD	0.831	0.000	0.000	0.000
KNOW MORE	0.824	0.000	0.000	0.000
IMPORTANT	0.776	0.000	0.000	0.000
NOT READ	-0.664	0.000	0.000	0.000
APPLIES	0.651	0.000	0.000	0.000
RELEVANT	0.648	0.000	0.000	0.000
UNDERSTAND	0.000	0.913	0.000	0.000
HARD1	0.000	0.913	0.000	0.000
HARD2	0.000	0.738	0.000	0.000
KNEW ABOUT	0.000	0.000	0.917	0.000
KNEW TOPIC	0.000	0.000	0.871	0.000
FAMILIAR	0.000	0.000	0.770	0.000
ACTIVE	0.000	0.000	0.000	0.834
ENTERTAIN	0.278	0.000	0.000	0.807
EXCITING	0.439	0.000	0.000	0.756
Sum of Squared Loadings	4.333	2.331	2.302	2.208

BMDP replaces loadings less than 0.2500 with zero.

Total proportion of variance in data space explained by factors: 0.70

Table 1b

Thunderstorm Report Only
Sorted Rotated Factor Loadings
(N = 150)

Variables	Factor 1 Relevant	Factor 2 Entertain	Factor 3 Familiar	Factor 4 Difficult
FRIENDS	0.829	0.000	0.000	0.000
GLAD	0.784	0.324	0.000	0.000
APPLIES	0.772	0.000	0.000	0.000
KNOW MORE	0.750	0.304	0.000	0.000
IMPORTANT	0.716	0.326	0.000	0.000
RELEVANT	0.672	0.000	0.000	0.000
NOT READ	-0.649	-0.340	0.000	0.000
ENTERTAIN	0.267	0.818	0.000	0.000
ACTIVE	0.279	0.817	0.000	0.000
EXCITING	0.458	0.794	0.000	0.000
KNEW ABOUT	0.000	0.000	0.880	0.000
KNEW TOPIC	0.000	0.000	0.850	0.000
FAMILIAR	0.000	0.000	0.785	0.000
UNDERSTAND	0.000	0.000	0.000	0.890
HARD2	0.000	0.000	0.000	0.882
HARD1	0.000	0.000	0.000	0.710
Sum of Squared Loadings	4.271	2.570	2.337	2.220

BMDP replaces loadings less than 0.2500 with zero.

Total proportion of variance in data space explained by factors: 0.71

Table 1c

Furniture Testing Report Only
Sorted Rotated Factor Loadings
(N = 149)

Variables	Factor 1 Relevant	Factor 2 Entertain	Factor 3 Difficult	Factor 4 Familiar
FRIENDS	0.841	0.000	0.000	0.000
GLAD	0.823	0.000	0.000	0.000
KNOW MORE	0.802	0.000	0.000	0.000
IMPORTANT	0.754	0.000	0.000	0.000
APPLIES	0.716	0.000	0.000	0.000
RELEVANT	0.693	0.000	0.000	0.000
NOT READ	-0.606	0.000	0.000	0.000
ENTERTAIN	0.000	0.883	0.000	0.000
EXCITING	0.310	0.839	0.000	0.000
ACTIVE	0.000	0.818	0.000	0.000
HARD2	0.000	0.000	0.870	0.000
UNDERSTAND	0.000	0.000	0.866	0.000
HARD1	0.000	0.000	0.715	0.000
KNEW ABOUT	0.000	0.000	0.000	0.862
KNEW TOPIC	0.000	0.000	0.000	0.829
FAMILIAR	0.000	0.000	0.000	0.749
Sum of Squared Loadings	4.160	2.375	2.129	2.113

BMDP replaces loadings less than 0.2500 with zero.

Total proportion of variance in data space explained by factors: 0.67

Table 1d

Blood Alcohol Report Only
Sorted Rotated Factor Loadings
(N = 150)

Variables	Factor 1 Relevant	Factor 2 Entertain	Factor 3 Familiar	Factor 4 Difficult
KNOW MORE	0.822	0.253	0.000	0.000
FRIENDS	0.812	0.000	0.000	0.000
IMPORTANT	0.756	0.000	0.000	0.000
GLAD	0.725	0.311	0.000	0.000
NOT READ	-0.608	-0.267	0.000	0.000
RELEVANT	0.599	0.000	0.000	0.000
APPLIES	0.553	0.000	0.342	0.000
ENTERTAIN	0.000	0.865	0.000	0.000
ACTIVE	0.000	0.788	0.000	0.000
EXCITING	0.453	0.711	0.000	0.000
KNEW ABOUT	0.000	0.000	0.914	0.000
KNEW TOPIC	0.287	0.000	0.793	0.000
FAMILIAR	0.000	0.000	0.688	0.000
HARD2	0.000	0.000	0.000	0.862
UNDERSTAND	0.000	0.000	0.000	0.852
HARD1	0.000	0.000	0.000	0.679
Sum of Squared Loadings	3.876	2.239	2.114	2.053

BMDP replaces loadings less than 0.2500 with zero.

Total proportion of variance in data space explained by factors: 0.64

TABLE 2
Zero Order Correlation Matrix of Variables in Each Factor.

Pooled Data
(N = 149)

Factor 1: Relevant (Cronbach's alpha = .887)

	IMPORTANT	RELEVANT	APPLIES	KNOW MORE	NOT READ	FRIENDS	GLAD
IMPORTANT	-	.599	.489	.517	-.433	.572	.614
RELEVANT		-	.428	.480	-.345	.491	.497
APPLIES			-	.539	-.378	.505	.482
KNOW MORE				-	-.600	.692	.755
NOT READ					-	-.470	-.527
FRIENDS						-	.707
GLAD							-

Factor 2: Difficult (Cronbach's alpha = .832)

	UNDERSTAND	HARD 1	HARD 2
UNDERSTAND	-	.510	.830
HARD 1		-	.527
HARD 2			-

Factor 3: Familiar (Cronbach's alpha = .830)

	KNEW ABOUT	KNEW TOPIC	FAMILIAR
KNEW ABOUT	-	.748	.610
KNEW TOPIC		-	.498
FAMILIAR			-

Factor 4: Entertain (Cronbach's alpha = .840)

	ACTIVE	ENTERTAIN	EXCITING
ACTIVE	-	.584	.635
ENTERTAIN		-	.689
EXCITING			-

All correlations significant at alpha = .01 or better.

TABLE 3a

Ability of Factors to Predict Interest.

Stepwise Multiple Regression.

Pooled Reports

Dependent Variable is NOT INTERESTED

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
Relevant	-.588	.3474	.3474	1,146	77.73**
Entertain	-.535	.6342	.2867	2,145	113.64**

F for Total R^2
$F(2,145) = 125.67$**

Adjusted $R^2 = .6291$

Dependent Variable is INTEREST STOP

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
Relevant	.536	.2862	.2862	1,146	58.54**
Entertain	.447	.4862	.2000	2,145	56.45**
Difficult	-.109	.4982	.0120	3,144	3.44*

F for total R^2
$F(3,144) = 47.66$**

Adjusted $R^2 = 0.4878$

* $p < .05$
** $p < .01$

TABLE 3b

Ability of Factors to Predict Interest.

Stepwise Multiple Regression.

Thunderstorm Report Only

Dependent Variable is NOT INTERESTED

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
Entertain	-.568	.3384	.3384	1,146	74.66**
Relevance	-.514	.6001	.2617	2,145	94.88**
Familiar	-.136	.6186	.0186	3,144	7.01**

F for Total R^2
$F(3,144) = 77.86^{**}$

Adjusted $R^2 = .6107$

Dependent Variable is INTEREST STOP

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR2	df	F
Entertain	.563	.3337	.3337	1,146	73.11**
Relevance	.555	.6344	.3008	2,145	119.30**
Familiar	.160	.6597	.0252	3,144	10.67**
Difficult	-.079	.6659	.0062	4,143	2.67*

F for Total R^2
$F(4,143) = 71.25$
Adjusted $R^2 = .6565$

* $p < .05$
** $p < .01$

TABLE 3c

Ability of Factors to Predict Interest.

Stepwise Multiple Regression.

Furniture Testing Report Only

Dependent Variable is NOT INTERESTED

Independent Variable Entered	BETA Simultaneous	Multiple R^2	Multiple sR^2	df	F
Entertain	-.538	.2896	.2896	1,146	59.51**
Relevance	-.535	.5758	.2862	2,145	97.85**

F for Total R^2
$F(2,145) = 98.42$**

Adjusted $R^2 = 0.5700$

Dependent Variable is INTEREST STOP

Indepcndtnt Variable Entered	BETA Simultaneous	Multiple R^2	Multiple sR^2	df	F
Relevance	.531	.2817	.2817	1,146	57.25**
Entertain	.439	.4742	.1926	2,145	53.11**
Difficulty	-.114	.4872	.0129	3,144	3.63

F for Total R^2
$F(3,144) = 45.60$**

Adjusted R2 = .4765

* $p < .05$
** $p < .01$

TABLE 3d

Ability of Factors to Predict Interest. Stepwise Multiple Regression.

Blood Alcohol Report Only

Dependent Variable is NOT INTERESTED

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
Relevance	-.685	.4671	.4671	1,146	127.99**
Entertain	-.462	.6809	.2138	2,145	97.15**

F for Total R2
$F(2,145) = 154.71$**

Adjusted $R^2 = .6765$

Dependent Variable is INTEREST STOP

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR2	df	F
Relevance	.496	.2442	.2442	1,146	47.18**
Entertain	.395	.4005	.1563	2,145	37.80**

F for Total R^2
$F(2,145) = 48.43$**

Adjusted $R^2 = .3922$

* p <.05
** p <.01

TABLE 3a

Predicting Memory.

Stepwise Multiple Regressions.

Pooled Reports

Independent Variables are Factor Scores

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
Entertain	.121	.0149	.0149	1,146	2.21
Difficult	-.105	.0255	.0106	2,145	1.58
Familiar	.092	.0340	.0085	3,144	1.26

F for Total R^2
$F(3,144) = 1.69$

Adjusted $R2 = .0139$

Independent Variables are INTEREST STOP and NOT INTERESTED

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
INTEREST STOP	.091	.0083	.0083	1,146	1.23

F for Total R^2
$F(1,146) = 1.23$

Adjusted $R^2 = 0.0015$

* $p < .05$
** $p < .01$

TABLE 4b

Predicting Memory.

Stepwise Multiple Regressions.

Thunderstorm Report Only

Independent Variables are Factor Scores

Independent Variable Entered	BETA Simultaneous	Multiple R2	Multiple sR^2	df	F
Entertaining	.275	.0759	.0759	1,146	11.99**
Familiar	.154	.0996	.0237	2,145	3,82*

F for Total R2
F(2,145) = 8.02**

Adjusted R^2 = .0872

Independent Variables are INTEREST STOP and NOT INTERESTED

Independent Variable Entered	BETA Simultaneous	Multiple R^2	Multiple sR^2	df	F
INTEREST STOP	.242	.0587	.0587	1,146	9.10**

F for Total R^2
F(2,145) = 9.10**

Adjusted R^2 = .0522

* p <.05
** p <.01

TABLE 4c

Predicting Memory.

Stepwise Multiple Regressions.

Furniture Testing Report Only

Independent Variables are Factor Scores

Independent Variable Entered	BETA Simultaneous	Multiple R^2	Multiple sR^2	df	F
Relevance	.0145	.0211	.0211	1,146	3.15
Difficulty	-.0121	.0357	.0146	2,145	2.19

F for Total R^2
$F(2,145) = 2.69$

Adjusted $R^2 = .0224$

Independent Variables are INTEREST STOP and NOT INTERESTED

Independent Variable Entered	BETA Simultaneous	Multiple R^2	Multiple sR^2	df	F
INTEREST STOP	.127	.0160	.0160	1,146	2.38

F for Total R^2
$F(1,146) = 2.38$

Adjusted $R^2 = .0093$

* $p < .05$
** $p < .01$

TABLE 4d

Predicting Memory.

Stepwise Multiple Regressions.

Blood Alcohol Report Only

Independent Variables are Factor Scores

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
Familiar	.094	.0089	.0089	1,146	1.3107

F for Total R^2
$F(1,146) = 1.31$

Adjusted $R^2 = 0.0021$

Independent Variables are INTEREST STOP and NOT INTERESTED

Independent Variable Entered	BETA Simul-taneous	Multiple R^2	Multiple sR^2	df	F
INTEREST STOP	.074	.0055	.0055	1,146	0.81

* $p < .05$
** $p < .01$

Appendix A

Transcripts of Sample Report

THUNDERSTORMS

The Great Plains are battered by some of the most violent weather in the United States. Hail flattens crops, tornados cause millions of dollars of damage and kill or injure hundreds each year. Some of this weather is spawned by thunderstorms that develop over the Rocky Mountains. To find out how such severe thunderstorms evolved, researchers at the National Oceanic and Atmospheric Administration and Colorado State University have started a new program.

[STOP]

As soon as the so called superstorm, that's a cluster of connected severe thunderstorms, is sighted, they take off in an airborne laboratory. The same plane in fact that flies through hurricanes.

[STOP]

During the day, they can see the anvil-shaped clouds that tower up as high as 11 miles. At night, however, they can see the weather outside the plane only during flashes of lightning. No plane could survive the 135 mile per hour up and down drafts that roar inside a thunderstorm; so, the scientists rely on sophisticated color weather radar to observe the storms from a safe distance. On-board computers store a variety of data.

[STOP]

On this mission, the superstorm stretched nearly 200 miles across Colorado. Better weather forecasting to help save property and lives is the long-term goal of the daring scientists who chase thunderstorms. This report was produced with the support of the National Science Foundation and the General Motors Research Laboratories.

[STOP]

Appendix B

Sample Evaluation Questions

Please rate the THUNDERSTORM story on the following scales by placing an x in the location on the scale that best represents your opinion of this story.

Important	____:	____:	____:	____:	____:	____:	____: Unimportant
Unusual	____:	____:	____:	____:	____:	____:	____: Usual
Exciting	____:	____:	____:	____:	____:	____:	____: Dull
Entertaining	____:	____:	____:	____:	____:	____:	____: Not Entertaining
Active	____:	____:	____:	____:	____:	____:	____: Passive
Poorly Written	____:	____:	____:	____:	____:	____:	____: Well Written
Relevant	____:	____:	____:	____:	____:	____:	____: Irrelevant
Hard	____:	____:	____:	____:	____:	____:	____: Easy
Familiar	____:	____:	____:	____:	____:	____:	____: Unfamiliar
Not Interesting	____:	____:	____:	____:	____:	____:	____: Very Interesting

GO TO NEXT PAGE

Considering the THUNDERSTORM story, for the following questions please indicate by placing an x on the scale below each question how strongly <u>you</u> agree or disagree with each statement.

{All remaining items had the following scale underneath:}

Strongly Agree	Agree	Agree Somewhat	Disagree Somewhat	Disagree	Strongly Disagree
:__________	:__________	:__________	:__________	:__________	:__________:

1. The story applies to my life.
2. I had a hard time understanding parts of the story.
3. I already knew a great deal about this specific topic.
4. I didn't pay much attention to this story.
5. I would like to know more about the topic.
6. The passage was hard to understand.
7. If I saw a story on this topic in a magazine, I would <u>not</u> read it.
8. I think my friends and/or family should know about this.
9. I know a lot about related topics.
10. I'm glad I found out about this.